THE CHANGE OF EFFECTIVE FUNDAMENTAL ANALYSIS VARIABLE AFTER FINANCIAL CRISIS

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Abstract

In this study's analysis pre and post the Financial Crisis, the value correlations of the accounting information and the additional explanation ability of the fundamental variables were found to be very high after the Financial Crisis. The significant fundamental variables varied pre and post the crisis. Inventory (SALINV) was found to be significant before the Financial Crisis but was found insignificant after. On the other hand, Accounts Receivable (ΔSALAR) and Personnel Expenses (ΔASLR) were not significant before the Financial Crisis but significant after the crisis, and the signs also changed from negative (-) to positive (+). Meanwhile, Gross Profits (ΔGMSAL) showed negative (-) coefficients before the crisis, but showed positive (+) coefficients after.

*Also, the results from conducting regression analysis using POST, which is the dummy variable representing the periods pre and post the Financial Crisis, show that Gross Profits (POST*ΔGMSAL), Sales (POST*ΔSALA), Cost of Sales (POST*ΔCGSA), Accounts Receivable (POST*ΔSALAR) and Personnel Expenses (POST*ΔASLR) showed positive (+) signs, but Equipment Investment (POST*ΔCAPEX) and Assets (POST*ΔASA) showed negative (-) signs*

Keywords: Korean Economy, Fundamental Analysis, Financial Crisis.

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1. Introduction

The Korean economy has been undergoing many changes since the 1997 Financial Crisis. Such radical changes in the capital market include expansion in foreign stock investments in stocks, full-scale advance of foreign financial institutions into the Korean market, selling off domestic enterprises overseas, and the expansion of foreign ownership rate in domestic enterprises. Owing to such rapid changes after the Financial Crisis, investment methods in the Korean stock market have also changed. As is the case with other countries, investment analysts of securities companies in Korea evaluate the intrinsic value of the enterprises through fundamental analysis using financial statements and the current investment opinions on applicable enterprises and industries. Generally after the crisis, investments in stocks are advised based on the opinions of these securities analysts.

Particularly after the crisis, the country's securities companies made full-scale investments in establishing research centers competitively based on favorable business results following the stock market boom in 1998. Backed by the extensive investments in the business analysis sector, investment analysts have been greatly growing both qualitatively and quantitatively. (Analysts utilizing fundamental analysis are considered the best analysts by media organizations.) Based on such growths, research centers of securities companies have been able to conduct more systematic and logical corporate analyses. Accordingly, the use of corporate analysis reports has become generalized and the influence of investment analysts continues to expand. The investment analysts of securities companies utilized the fundamental analysis in order to find and analyze the stocks that deviate from intrinsic values as being overestimated or underestimated in the efficient market. The investment strategy that utilizes fundamental analysis suggests to buy underestimated stocks and to sell overestimated stocks.

Meanwhile, focusing on profit information, researches have been made on the effect of information that began to support the utility of financial statements information in the study of accounting. Such research works were based on the assumption that the sum of the present value of future cash flows is the corporate value and that the profit information can be used as the replacing value of cash flows. In the actual capital market, however, the ability to explain the fluctuations of stock prices is found to be minimal. This is primarily due to the fact that profit information is only one part of a company's economic value as contained in the financial statements but the stock prices reflect all information factors contained in the statements. In other words, profit data on the financial statements are important information with regard to the evaluation of corporate values but are only a part of various accounting information. Accordingly, in order to evaluate the utility of financial statements, all the pieces of information reflected in the financial statements should be used, and not only the ones on profit.

From the viewpoint of fundamental analysis, this study observed that one can predict future profits by using the collection of information besides the information on stock prices alone on the assumption that stock prices do not sufficiently represent all the necessary information. This thesis therefore attempts to verify how much the Financial Crisis has influenced the effects of financial statements information in the country's capital market by utilizing the variables of fundamental analyses that have been generalized through the Financial Crisis.

This thesis consists of the following. Chapter 1 explains research objectives and purposes; Chapter 2 explains the conceptual framework of performing the research and describes the research designs; Chapter 3 proves the analysis and presents the results of analysis; and Chapter 4 discusses the results of the research.

II. Research Design

1. Setting Up Hypotheses

Starting from the Financial Crisis that greatly changed the Korean economy, this research will verify whether there are any differences before and after the financial crisis in the use of the financial statements information that utilizes fundamental analysis variables. The reasons for verifying this are twofold. First, due to the Financial Crisis, the accounting transparency of domestic companies was emphasized, expectations for the local companies' accounting information were raised and the responsibility for inappropriate accounting was reinforced. Second, the domestic financial market environment has rapidly changed due to full-scale foreign investments. And, as investment analysts of securities companies have been engaged in full-fledged activities, fundamental analyses utilizing the financial statements have been very active. Actually, due to substantial business analysis investments since 1999, the business analysis sector of the domestic securities companies has been experiencing rapid quantitative expansion and qualitative growth. Also, the competitions among the investment analysts of securities companies have intensified due to several special events sponsored by news media such as the selection of the best analyst and other prize awards, which have caused general investors to recognize fundamental analysis. Based on this, additional and more diverse fundamental analysis data have been produced and transmitted through diverse channels to investors. So, Hypothesis 1 was set up since it was expected that there would be differences in the use of financial statements that utilize fundamental analysis variables before and after the Financial Crisis.

Hypothesis 1: There are no differences in the use of financial statements that utilizes fundamental analysis variables before and after the Financial Crisis.

Before the crisis, the local companies focused mainly on sales growth rather than on profitability in business management. Such expansion-oriented management led to over borrowing, which was one of the causes of the Financial Crisis. During the crisis however, the local enterprises lowered their debt ratio and focused on profit-oriented management rather than on sales growth. Investors also evaluated the companies and decided to make investments based on profitability rather than on sales or on the asset size of the companies concerned. Due to this, along with the utility of fundamental analysis variables, the variables representing profitability, Gross Profits (ΔGMSAL), Cost of Sales (ΔCGSA), and Personnel Expenses (ΔASLR) are expected to be more significant during after the crisis. So, in addition to the above hypothesis, Hypothesis 2 was set up since it was expected that there would be differences in value correlations of Gross Profits (ΔGMSAL), Cost of Sales (ΔCGSA) and Personnel Expenses (ΔASLR).

Hypothesis 2: Of the fundamental analysis variables, there are no differences in the value correlations of the fundamental analysis variables representing profitability, Gross Profits (ΔGMSAL), Cost of Sales (ΔCGSA) and Personnel Expenses (ΔASLR) before and after the crisis.

On the other hand, during crisis, the local companies lowered their debt ratios, sold off non-business properties and pushed forward restructuring, which are factors that favored the stock market. Variables representing an enterprise’s external growth such as equipment investment (ΔCAPEXA) or assets (ΔASA) are expected to have negative (-) impact on the earning rates after the Financial Crisis. In addition therefore, Hypothesis 3 was set up since it was expected that there would be differences in the value correlations of Equipment Investment (ΔCAPEXA) or Assets (ΔASA) representing the external growth of a company before and after the Financial Crisis.

Hypothesis 3: Of the fundamental analysis variables, there are no differences in the value correlations of the fundamental analysis variables representing an enterprise’s external growth, Equipment Investment (ΔCAPEXA) or Assets (ΔASA).

2. Selection of Variables

This research attempts to verify the utility of the financial statements by using a total of 16 fundamental analysis variables, which are made up of eight fundamental analysis variables that can be applied to the Korean market, 12 fundamental analysis variables are based on the expertise of American securities analysts presented in the dissertation of Lev and Thiagarajan (1993), and eight fundamental analysis variables that do not overlap with the other eight fundamental analysis variables of American securities analysts.

In general, the distinction between good signal and bad signal is clear in the accounting profit information but unclear in the non-profit accounting information. Investment analysts of securities companies generally interpret accounting information that is based on fundamental analysis. For example, the imbalanced increase in inventory is interpreted as bad signal. Of course, such imbalance can be due to the managers’ expected increase in sales. Although such interpretation is not always right, this research makes the necessary judgment regarding the signal of non-profit accounting information in accordance with the criteria that the securities analysts use to distinguish between good signal and bad signal when conducting fundamental analysis. In general, a sharp increase in inventory more than net sales means the company is experiencing sales difficulties. Moreover, such imbalanced increase in inventory will force management to attempt to maintain the level of inventory, which will reduce profit. Besides, an increase in inventory will lower future profit due not only to the opportunity cost of inventory purchase, inventory storage costs, inventory diminution and loss but also to the reserve of overhead costs allotted to inventory. Accordingly, in general, the increase in inventory is regarded as a bad signal and the decrease in inventory is a good signal.

In this research, the rate of increase in sales less the rate of increase in inventory is denoted as ΔSALINV.

Accordingly, as mentioned above, the value of the variable resulting from the increase in inventory is expected to be negative (-) or as a bad signal, and the value of the variable resulting from the decrease in inventory is expected to be positive (+) or as a good signal. It is expected to have the same effect on the fluctuation of stock prices.

The rate of increase in inventory is calculated by dividing the change in the inventory amount at the end of the current year (t) compared with the inventory amount at the end of the immediate previous year by the inventory amount at the end of the immediate previous year. This can be expressed as:

$$\Delta SALINV_t = (Inventory_{t} - Inventory_{t-1})/Inventory_{t-1}$$

This equation shall be used to determine the rate of increase in sales and all the other fundamental analysis variables that are discussed below. Table 1 below summarizes the investment analysts of securities companies that are used in this research.

Table 1: Definition of Fundamental Analysis Variables

Fundamental Analysis Variables	Measurement of Variables
1. Inventory	The increase rate of sales – the increase rate of inventory
2. Accounts Receivable	The increase rate of sales – the increase rate of accounts receivable
3. Equipment Investment	The increase rate of equipment investment – the increase rate of equipment investment of the same industry
4. Gross Profits	The increase rate of gross profits – the increase rate of sales
5. Selling and Administrative Expenses	The increase rate of sales – the increase rate of selling/administrative expenses
6. Bad Loan Reserves	The increase rate of bad loan reserves – the increase rate of accounts receivable
7. Effective Corporate Tax Rates	(Before tax net profit per share/stock price of the immediate prior year)
8. Labor and Personnel	The increase rate of sales compared with immediate prior year per employee
9. Sales	The increase rate of sales – the increase rate of sales of the same industry
10. Accounts payable	The increase rate of sales – the increase rate of accounts payable
11. Cash Flow	The increase rate of cash flow compared with the immediate prior year per share
12 Liquidity	The increase rate of current assets – the increase rate of current liabilities
13. Debt	The increase rate of liabilities – the increase rate of current liabilities
14. Cost of Sales	The increase rate of cot of sales of the same industry – the increase rate of cost of sales
15. Personnel Expenses	The increase rate of personnel expenses of the same industry– the increase rate of personnel expenses
16. Assets	The increase rate of assets – the increase rate of assets of the same industry

* Variables 1to 8 are the variables used by Lev and Thiagarajan, and variables, 9 to 16 are used by Korean investment analysts that do not overlap with 1 to 8.

3. The Enterprises Analyzed

Among the enterprises listed on the Korea Stock Exchange from January 1, 1992 to December 31, 2001, the sample enterprises include the companies settling accounts in December and whose stock prices and financial statements data are included in the database of the enterprises information warehouse TS2000 of the Korea Listed Companies Association, excluding the following companies:

(1) Banks, investment finance companies, securities companies and insurance companies. (Financial industries and similar services industries widely differ from the other industries in business activities, asset structures and accounting policies.)

(2) Stocks that are classified as controlled. (Their trade was sluggish or even discontinued, incurring problems in data continuity.) This research may have certain biases in the sampling as it included only the relatively sound enterprises.

(3) Company stocks that were merged from January 1993 to December 2001 (due to the same reason of the problems of data continuity).

The period applicable begins in 1992 in consideration to the fact that in 1993 the country's capital market opened and investment organizations including securities companies began to adopt the fundamental analysis.

4. Descriptive Statistics

As the summary of descriptive statistics of the variables used in this research, Table 2 shows mean, median, and the percentage value of the parts within 1% and 5% at both ends of the distribution of the variables. The distribution of the value of ΔEARN poses a serious problem in extreme value in that it ranges from the minimum of -38.62 to the maximum of 80.79. So, the extreme value in ΔEARN was treated through "winsorize" at the values of ±1 at both ends of the distribution.

Table 2: Descriptive Statistical Measures of the Sample

2299 Enterprises/Year, 1993-2001

Variables	Mean	Standard Deviation	Minimum	1% Value	Median	99% Value	Maxmum
Rt	0.072	0.704	-0.940	-0.853	-0.031	2.040	14.000
ΔEARN	0.183	0.336	-38.62	-4.280	-0.000	8.713	80.79
ΔSALINV	-0.000	0.373	-2.805	-1.290	-0.026	0.878	1.990
ΔSALAR	-1.703	0.405	-80.20	-46.63	-1.703	70.70	166.35

ΔCAPEXA	-0.626	-10.00	-82.07	-54.76	-10.00	184.251	380.35
ΔGMSAL	0.024	2.237	-87.33	-1.843	0.010	2.308	23.71
ΔSALSA	0.013	0.288	-1.475	-0.642	-0.002	0.902	3.603
ΔBDAR	0.683	3.915	-5.383	-1.277	0.000	13.523	80.55
ΔETR	0.254	3.709	-5.499	-0.249	0.000	2.220	96.53
ΔSALPP	-15.05	26.52	-278.8	-114.95	-10.98	35.70	73.50
ΔSALA	-0.293	19.49	-80.20	-46.743	-1.788	70.426	166.35
ΔSALAP	-0.128	1.308	-25.15	-3.0698	0.000	0.960	19.64
ΔCFPS	-18.33	335.76	-15380	-96.267	-9.841	43.212	393.21
ΔASDB	-.005	0.462	-9.36	-1.544	-0.001	0.715	2.81
ΔDEBT	-0.005	0.387	-9.60	-1.232	-0.002	0.6031	0.98
ΔACGS	1.086	4.32	-2.40	-0.706	-0.004	18.633	19.51
ΔASLR	0.003	0.265	-2.63	-0.728	-0.003	0.621	1.12
ΔASA	0.000	0.229	-2.64	-0.7994	0.003	0.448	1.12

Pearson correlation coefficients among the proof model variables that were used when proof analysis was conducted on the sample of the enterprises/accounting year are shown in Table 3.

Table 3: Correlation Coefficients of Variable of Proof Models

	Rt	ΔEARN	ΔSALINV	ΔSALAR	ΔCAPEXA	ΔGMSAL	ΔSALSA	ΔBDAR	ΔETR
Rt	1	0.19*** 0	0.11*** 0	0.11*** 0	0 -0.447	0 -0.445	-0.02 -0.168	-0.06*** -0.005	0.06 -0.004
ΔEARN		1	0.09*** 0	0.04 -0.023	-0.02 -0.188	0.03 -0.067	-0.20*** 0	-0.06*** -0.002	-0.01 -0.285
ΔSALIN			1	0.10***	-0.07***	-0.04	-	-0.03	-0.05

V				0	-0.001	-0.034	0.13*** 0	-0.076	-0.018
ΔSALAR				1	-0.03 -0.089	0 -0.444	-0.09*** 0	-0.03 -0.082	-0.04 -0.032
ΔCAPEXA					1	-0.01 -0.262	0 -0.465	-0.03 -0.128	0.03 -0.106
ΔGMSAL						1	0.03 -0.061	0 -0.483	0 -0.424
ΔSALSA							1	0.20*** 0	0.01 -0.385
ΔBDAR								1	-0.01 -0.32
ΔETR									1

When the correlations among the independent variables are high, the core model of this research can cause the problem of Multicolinearity at the time of multiple regression analysis. In this research, however, the problem of Multicolinearity is not considered a serious threat in view of the figures of VIF and condition index in the later multiple regression analysis.

5. Research Methodology

In order to verify the hypotheses, this research examines the utility of the information of fundamental analysis variables before and after the Financial Crisis. The basic regression model used to prove the research hypotheses is as follows:

$R_{t,i}=a_0+a_1\Delta EARN_{t,i}+V_{t,i}$ ··· (1)

$R_{t,i}$ = Stock earning rates from April, Year t to March, Year t+1

$\Delta EARN_{t,i}$ = Change in EPS of i enterprises in the Year t divided by the stock prices of Year t-1

In this research, each fundamental signal is defined such that the more positive value it has by logical inference, the more positive effects they have on the excess earning rates. Accordingly, the purpose of this research is to verify whether or not bj, which is coefficient of each Sj, has positive value when the fundamental analysis variables are used as additional independent variables. If bj has positive value it can be interpreted as having positive influence on the future earning rates.

Each of partial F values are examined in order to determine the adaptability of the model. In the regression model, Rt is the buy-and-hold stock prices earning rates for the period t from April to March of the succeeding year, and ΔEARNt is the change in EPS for the period t divided by the stock prices of the previous year, and a and b are coefficients of the regression model. When fundamental analysis variables are not useful at all, the slope coefficient b should be 0, and when fundamental analysis variables are useful, b should be greater than 0 (b>0). So, partial F value is the value used to verify the regression coefficient for the fundamental signal in its entirety, as well as to prove the hypothesis that the regression coefficients of the fundamental signals are all 0. If partial F value is high, then the hypothesis that the regression coefficients are all 0 can be rejected.

In order to verify whether or not there are differences in the utility of non-profit financial statements information before and after the Financial Crisis which greatly impacted the Korean economy, this research repeated the regression analysis three years (1994 to 1996) before the crisis and three years (1999 to 2001) after. This study also verifies whether the regression coefficient Bj of the fundamental analysis variables differ before and after the said crisis.

$$R_{t,i}=a_0+a_1\Delta EARN_{t,i}+b_{1t}\Delta SALINV_{t,i}+b_{2t}\Delta SALAR_{t,i}+b_{3t}\Delta CAPEXA_{t,i}+b_{4t}\Delta GMSAL_{t,i}+b_{5t}\Delta SALSA_{t,i}+b_{6t}\Delta BDAR_{t,i}+b_{7t}\Delta ETR_{t,i}+b_{8t}\Delta SALPP_{t,i}+b_{9t}\Delta SALA_{t,i}+b_{10t}\Delta SALAP_{t,i}+b_{11t}\Delta CFPS_{t,i}+b_{12t}\Delta ASDB_{t,i}+b_{13t}\Delta DEBT_{t,i}+b_{14t}\Delta ACGS_{t,i}+b_{15t}\Delta ASLR_{t,i}+b_{16t}\Delta ASA_{t,i}+V_{t,i} \cdots\cdots (2)$$

The period before and after the Financial Crisis are divided into two periods, 1994-1996 and 1999-2001, because 1997 was the year of the crisis and 1998, the following year, was excluded. In 1999, the Accounting Institute aimed to enhance the transparency of accounting was established. Furthermore, in order to verify whether there were changes in the fundamental analysis variables which investors consider important in making decisions on investment, the regression analysis is conducted on the Regression Model (3) in which the dummy variable, Post, representing the period before and after the crisis was added into the regression expression.

$$R_{t,i}=a_0+a_1\Delta EARN_{t,i}+b_{1t}\Delta SALINV_{t,i}+b_{2t}\Delta SALAR_{t,i}+b_{3t}\Delta CAPEXA_{t,i}+b_{4t}\Delta GMSAL_{t,i}+b_{5t}\Delta SALSA_{t,i}+b_{6t}\Delta BDAR_{t,i}+b_{7t}\Delta ETR_{t,i}+b_{8t}\Delta SALPP_{t,i}+b_{9t}\Delta SALA_{t,i}+b_{10t}\Delta SALAP_{t,i}+b_{11t}\Delta CFPS_{t,i}+b_{12t}\Delta ASDB_{t,i}+b_{13t}\Delta DEBT_{t,i}+b_{14t}\Delta ACGS_{t,i}+b_{15t}\Delta ASLR_{t,i}+b_{16t}\Delta ASA_{t,i}+c_{1t}POST*\Delta SALINV_{t,I}+c_{2t}POST*\Delta SALAR_{t,i}+c_{3t}POST*\Delta CAPEXA_{t,i}+c_{4t}POST*\Delta GMSAL_{t,i}+c_{5t}POST*\Delta SALSA_{t,i}+c_{6t}POST*\Delta BDAR_{t,i}+c_{7t}POST*\Delta ETR_{t,i}+c_{8t}POST*\Delta SALPP_{t,i}+c_{9t}POST*\Delta SALA_{t,i}+c_{10t}POST*\Delta SALAP_{t,i}+c_{11t}POST*\Delta CFPS_{t,i}+c_{12t}POST*\Delta ASDB_{t,I}+c_{13t}POST*\Delta DEBT_{t,i}+c_{14t}POST*\Delta ACGS_{t,i}+c_{15t}POST*\Delta ASLR_{t,i}+c_{16t}POST*\Delta ASA_{t,i}+V_{t,i}\cdots\cdots (3)$$

Provided POST= 1 if after the Financial Crisis, otherwise, POST= 0

III. Results

Table 4: shows the results of the regression analysis on each of the two period-groups before and after the crisis, into which the sample was divided based on the criteria set up previously. The explanation ability of the fundamental analysis variables before and after the crisis was compared. The R2 of the period after the Financial Crisis was 0.172, higher than 0.102 of the period before the Financial Crisis. This means the explanation ability of the fundamental analysis variables after the Financial Crisis was found to be higher. Also, when only accounting profits were used as an independent variable, the R2 for the period after the Financial Crisis was 0.050, which is higher than 0.026 for the period before the Financial Crisis. This now means that the explanation ability of accounting profits was found to be higher. With regard to the increase in the additional explanation ability of the fundamental analysis variables, the R2 increase before the crisis was 0.076 whereas the R2 increase after the crisis was 0.122, which means the additional explanation ability of the fundamental analysis variables after the Financial Crisis was found to be higher.

The results of the regression analysis by group showed that before the Financial Crisis, Gross Profits (ΔGMSAL), Sales (ΔSALA), and Cost of Sales (ΔCGSA) were found to be statistically significant at the level of 1%; Liquidity (ΔASDB) and Debt (ΔDEBT) were found to be significant at the level of 5%; and Inventory (ΔSALINV) was found to be significant at the level of 10%. After the Financial Crisis, Accounts Receivable (ΔSALAR), Sales (ΔSALA), Cost of Sales (ΔCGSA) and Personnel Expenses (ΔASLR) were found to be statistically significant at the level of 1%; Gross Profits (ΔGMSAL) were found to be significant at the level of 5%; and Liquidity (ΔASDB) and Debt (ΔDEBT) were found to be significant at the level of 10%. Thus, there were differences in significant fundamental analysis variables among the period-groups before and after the crisis.

Inventory (ΔSALINV) was found to be significant before the Financial Crisis but found insignificant after. Before the crisis, Inventory responded significantly in the positive (+) direction when the increase rate of sales is greater than that of Inventory, which means that in the period after the crisis it did not respond significantly. This means that before the crisis, Inventory showed significant results when the increase rate of Sales is higher than that of Inventory. After the crisis however, the mere fact that the increase rate of Sales is higher than that of Inventory was not received as good signal in the stock market.

As opposed to this, Accounts Receivable (ΔSALAR) and Personnel Expenses (ΔASLR) were not significant before the Financial Crisis but were found to be significant after, with the negative (-) sign changing into positive (+). This means that, with regard to Accounts Receivable (ΔSALAR), the increasing rate of Accounts Receivable exceeding that of Sales was received as negative (-) signal in the stock market during the Financial Crisis. In other words, the stock market responded negatively to the softening of payment terms or increasing Accounts Receivable during the crisis, all of which are commonly used to expand the external growth through sales growth. This is thought to be attributable to the fact that the increase in sales by the softening of payment terms deteriorates profitability. Also regarding Personnel Expenses, it is thought to be attributable to the fact that the increase in personnel expenses exceeding the industry average was received negatively (-) in the stock market since personnel expenses became a burden to a company's profitability as enterprises experienced the rapid rise in personnel expenses after the crisis.

Meanwhile, Gross Profits (ΔGMSAL) showed negative (-) coefficients before the Financial Crisis but positive (+) coefficients after. This means that before the crisis, growth was considered more important in the stock market than profitability. After the crisis however, profitability was considered more important. Such changes mean that investors saw profitability in their stock market investments as more important since companies that continued to focus on gross sales-oriented growth had difficulties during the crisis. This is attributable to the fact that after the Financial Crisis, the investment analysts of securities companies placed the greatest weight on profitability in their fundamental analysis.

Table 4: Comparison of the Results of Regression Analysis by Group Before and After the Financial Crisis

$$R_{t,i}=a_0+a_1\Delta EARN_{t,i}+b_{1t}\Delta SALINV_{t,i}+ b_{2t}\Delta SALAR_{t,i} + b_{3t}\Delta CAPEXA_{t,i} + b_{4t}\Delta GMSAL_{t,i} + b_{5t}\Delta SALSA_{t,i} + b_{6t}\Delta BDAR_{t,i} + b_{7t}\Delta ETR_{t,i} + b_{8t}\Delta SALPP_{t,i}+ b_{9t}\Delta SALA_{t,i} + b_{10t}\Delta SALAP_{t,i} + b_{11t}\Delta CFPS_{t,i} + b_{12t}\Delta ASDB_{t,i} + b_{13t}\Delta DEBT_{t,i} + b_{14t}\Delta ACGS_{t,i} + b_{15t}\Delta ASLR_{t,i} + b_{16t}\Delta ASA_{t,i} +V_{t,i}$$

	Whole	Financial Crisis	
		Before	After
ΔEARN	0.178 (0.000)	0.152 (0.000)	0.142 (0.000)
ΔSALINV	0.060** (0.012)	0.082* (0.055)	0.006 (0.891)
ΔSALAR	0.060*** (0.009)	-0.042 (0.301)	0.107*** (0.005)
ΔCAPEXA	0.068** (0.014)	0.014 (0.778)	-0.009 (0.854)
ΔGMSAL	- 0.009 (0.678)	-0.106*** (0.004)	0.088** (0.017)
ΔSALSA	0.075*** (0.002)	0.017 (0.756)	0.072 (0.114)
ΔBDAR	- 0.062*** (0.004)	-0.033 (0.377)	- 0.040 (0.312)
ΔETR	0.062***	-0.017	0.014

	(0.003)	(0.651)	(0.697)
ΔSALPP	0.085*** (0.001)	-0.021 (0.629)	0.053 (0.234)
ΔSALA	0.157*** (0.000)	0.285*** (0.000)	0.672*** (0.000)
ΔSALAP	0.012 (0.560)	0.026 (0.471)	0.026 (0.466)
ΔCFPS	0.014 (0.495)	-0.011 (0.816)	-0.000 (0.990)
ΔASDB	0.123*** (0.001)	0.140** (0.024)	0.128* (0.086)
ΔDEBT	- 0.130*** (0.000)	-0.154** (0.013)	-0.132* (0.080)
ΔACGS	0.179*** (0.000)	0.361*** (0.000)	0.585*** (0.000)
ΔASLR	0.093*** (0.000)	-0.072 (0.161)	0.134*** (0.004)
ΔASA	0.105*** (0.000)	0.019 (0.732)	0.006 (0.903)
R^2	0.117	0.102	0.172

*/**/*** represent statistical significance at the level of 10%, 5% and 1%, respectively.

Table 5 shows the results of the regression analysis by using POST, which is the dummy variable additionally representing the periods before and after the Financial Crisis in order to analyze the differences in the use of the fundamental analysis variables before and after the crisis. The results of the regression analysis showed that the R2, which represents the explanation amount of the regression model, was 0.143, representing an increase from the R2 of 0.117 shown before POST was taken. The F value of significant verification for the adaptability of the regression model was 11.403 and p value was 0.000, which was statistically significant at the level of 1%.

The dummy variables of equipment investment, POST*ΔCAPEX, of Gross Profits, POST*ΔGMSAL, of Sales, POST*ΔSALA and of Cost of Sales POST*ΔCGSA were significant at the level of 1%. Also, the dummy variables of Accounts Receivable POST*ΔSALAR, of Personnel Expenses, POST*ΔASLR and of Assets, POST*ΔASA were significant at the level of 5%.

With regard to the signs of beta value of the standardized coefficients of each value, the dummy variables of Gross Profits, POST*ΔGMSAL, of Sales, POST*ΔSALA, of Cost of Sales, POST*ΔCGSA, of Accounts Receivable POST*ΔSALAR, and of Personnel Expenses, POST*ΔASLR showed a positive sign (+), while the dummy variables of Equipment Investment, POST*ΔCAPEX, and of Assets, POST*ΔASA showed a negative (-) sign. This means that the fundamental analysis variables representing profitability such as Gross Profits (ΔGMSAL), Cost of Sales (ΔCGSA), Personnel Expenses (ΔASLR) and Sales (ΔSALA), and Accounts Receivable (ΔSALAR) became more significant in the stock market after the crisis. Such changes mean that investors consider profitability and stability in their stock market investments as more important since enterprises that continued to focus on gross sales-oriented growth had difficulties during the crisis. Also, Equipment Investment (ΔCAPEXA) and Assets (ΔASA), all of which represent the growth of the scale of enterprises, were found to have negative (-) effects during the crisis.

This agrees with the fact that company restructuring after the crisis was received as a good sign in the stock market.

Accordingly, the three hypotheses, Hypothesis 1 (which says there are no differences in the utility of the financial statements information utilizing the fundamental analysis variables before and after the crisis), Hypothesis 2 (which says there are no differences in the value correlations of the fundamental analysis variables representing profitability such as Gross Profits (ΔGMSAL), Cost of Sales (ΔCGSA), and Personnel Expenses (ΔASLR) before and after the crisis) and Hypothesis 3 (which says there are no differences in the value correlations of the fundamental analysis variables representing gross sales growth such as Equipment Investment (ΔCAPEXA) and Assets (ΔASA) before and after the crisis) were rejected.

In conclusion, there were differences in the value correlations of the fundamental analysis variables in the periods before and after the Financial Crisis, and the explanation ability of the fundamental analysis variables and profits was enhanced after the crisis. After the crisis, the value correlations of Gross Profits (ΔGMSAL), Cost of Sales (ΔCGSA) and Personnel Expenses (ΔASLR) of the fundamental analysis variables representing profitability were increased. On the other hand however, Equipment Investment (ΔCAPEXA) and Assets (ΔASA) of the fundamental analysis variables representing gross sales growth were found to have negative (-) effects.

Table 5: The Regression Analysis Result of the Regression Model (3)

$$R_{t,i}=a_0+a_1\Delta EARN_{t,i} + b_{1t}\Delta SALINV_{t,i}+ b_{2t}\Delta SALAR_{t,i} + b_{3t}\Delta CAPEXA_{t,i} + b_{4t}\Delta GMSAL_{t,i} + b_{5t}\Delta SALSA_{t,i} + b_{6t}\Delta BDAR_{t,i} + b_{7t}\Delta ETR_{t,i} + b_{8t}\Delta SALPP_{t,i}+ b_{9t}\Delta SALA_{t,i} + b_{10t}\Delta SALAP_{t,i} + b_{11t}\Delta CFPS_{t,i} + b_{12t}\Delta ASDB_{t,i} + b_{13t}\Delta DEBT_{t,i} + b_{14t}\Delta ACGS_{t,i} + b_{15t}\Delta ASLR_{t,i} + b_{16t}\Delta ASA_{t,i} + c_{1t}POST^*\Delta SALINV_{t,i} + c_{2t}POST^*\Delta SALAR_{t,i} + c_{3t}POST^*\Delta CAPEXA_{t,i} + c_{4t}POST^*\Delta GMSAL_{t,i} + c_{5t}POST^*\Delta SALSA_{t,i} + c_{6t}POST^*\Delta BDAR_{t,I}+ c_{7t}POST^*\Delta ETR_{t,i} + c_{8t}POST^*\Delta SALPP_{t,I} + c_{9t}POST^*\Delta SALA_{t,i}+ c_{10t}POST^*\Delta SALAP_{t,i} + c_{11t}POST^*\Delta CFPS_{t,i} + c_{12t}POST^*\Delta ASDB_{t,i} + c_{13t}POST^*\Delta DEBT_{t,i} + c_{14t}POST^*\Delta ACGS_{t,i} + c_{15t}POST^*\Delta ASLR_{t,i} + c_{16t}POST^*\Delta ASA_{t,i} + V_{t,i}$$

	Non-standardized Coefficients	Standardized	t	Significance	Colinearity Statistical Measures

			Coefficients		Probability		
	B	Standard Error	Beta			Tolerance Limit	VIF
(상수)	0.034	0.016		2.070	0.039		
ΔEARN	0.294	0.042	0.156	7.000	0.000	0.866	1.154
ΔSALINV	0.111	0.045	0.071	2.459	0.014	0.520	1.922
ΔSALAR	0.048	0.039	0.033	1.211	0.226	0.564	1.773
ΔCAPEXA	0.002	0.000	0.116	3.402	0.001	0.371	2.697
ΔGMSAL	- 0.007	0.006	- 0.030	-1.338	0.181	0.847	1.181
ΔSALSA	0.143	0.070	0.067	2.050	0.041	0.400	2.502
ΔBDAR	- 0.008	0.004	- 0.052	-2.146	0.032	0.734	1.363
ΔETR	0.012	0.004	0.069	2.977	0.003	0.791	1.264
ΔSALPP	0.001	0.001	0.049	1.635	0.102	0.483	2.071
ΔSALA	0.004	0.001	0.123	3.287	0.001	0.305	3.275
ΔSALAP	0.001	0.011	0.002	0.063	0.950	0.682	1.467
ΔCFPS	0.000	0.000	0.003	0.146	0.884	0.969	1.032
ΔASDB	0.183	0.058	0.132	3.177	0.002	0.250	4.002
ΔDEBT	- 0.279	0.076	- 0.157	-3.649	0.000	0.232	4.305
ΔACGS	0.024	0.003	0.189	8.466	0.000	0.863	1.158
ΔASLR	0.076	0.068	0.034	1.117	0.264	0.466	2.146
ΔASA	0.373	0.107	0.136	3.495	0.000	0.283	3.536
POST*ΔSALINV	- 0.079	0.080	- 0.029	-0.990	0.322	0.498	2.007
POST*ΔSALAR	0.139	0.070	0.053	1.980	0.048**	0.609	1.643
POST*ΔCAPEXA	- 0.002	0.001	- 0.084	-2.624	0.009***	0.421	2.377
POST*ΔGMSA	0.042	0.015	0.065	2.835	0.005***	0.823	1.214

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POST*ΔSALSA	0.026	0.105	0.008	0.243	0.808	0.361	2.770
POST*ΔBDAR	- 0.003	0.007	- 0.011	-0.437	0.662	0.663	1.509
POST*ΔETR	- 0.010	0.009	- 0.025	-1.080	0.280	0.776	1.288
POST*ΔSALPP	0.002	0.001	0.042	1.427	0.154	0.489	2.046
POST*ΔSALA	0.014	0.002	0.285	5.613	0.000***	0.166	6.025
POST*ΔSALAP	0.014	0.019	0.018	0.723	0.470	0.679	1.473
POST*ΔASDB	- 0.054	0.109	- 0.025	-0.496	0.620	0.168	5.947
POST*ΔDEBT	0.125	0.137	0.048	0.909	0.363	0.156	6.398
POST*ΔACGS	1.240	0.195	0.281	6.360	0.000***	0.219	4.568
POST*ΔASLR	0.304	0.121	0.079	2.508	0.012**	0.430	2.325
POST*ΔASA	- 0.429	0.176	- 0.091	-2.435	0.015**	0.307	3.263
Explanation Ability of Model	Sample Size : 1,999 R^2 : 0.156 Revised R^2 : 0.143 F value : 11.403(p Value .000)						

*/**/*** denotes statistical significance in the level of 10%, 5% and 1%, respectively.

IV. Conclusion and Suggestions

In this study's analysis before and after the Financial Crisis, the value correlations of the accounting information and the additional explanation ability of the fundamental variables were found to be very high after the crisis. The significant fundamental variables varied before and after the crisis. Inventory (SALINV) was found to be significant before the Financial Crisis but was found insignificant after. This means that the increase rate of Sales exceeding that of Inventory, responded in the positive (+) direction before the Financial Crisis, but did not respond significantly after. This means that during the crisis, the mere fact that the increase rate of Sales is greater than that of Inventory was not received as good signal in the stock market. On the other hand, Accounts Receivable (ΔSALAR) and Personnel Expenses (ΔASLR) were not significant before the Financial Crisis but significant after the crisis, and the signs also changed from negative (-) to positive (+). This means that during the crisis, the increase rate of Accounts Receivable exceeding that of Sales was received as a negative (-) sign in the stock market. In other words, during the crisis, the stock market responded negatively to the easing of payment terms that is commonly used for the gross sales growth through expanding sales of the enterprises or the increasing of Accounts Receivable through sales on credit. Regarding Personnel Expenses (ΔASLR), rapid increase in personnel expenses after the crisis became a burden on a company's profitability, so the increase in Personnel Expenses was received as a negative (-) signal in the stock market. Meanwhile, Gross Profits (ΔGMSAL) showed negative (-) coefficients before the crisis, but showed positive (+) coefficients after. This means that before the crisis, the stock market considered growth more important than profitability, but after the crisis, profitability became more important. Such changes mean that while undergoing the crisis, companies that continued to focus on gross sales-oriented growth underwent many difficulties, so that investors gave greater weight on profitability when investing in the stock market.

Also, the results from conducting regression analysis using POST, which is the dummy variable representing the periods before and after the Financial Crisis, show that Gross Profits (POST*ΔGMSAL), Sales (POST*ΔSALA), Cost of Sales (POST*ΔCGSA), Accounts Receivable (POST*ΔSALAR) and Personnel Expenses (POST*ΔASLR) showed positive (+) signs, but Equipment Investment (POST*ΔCAPEX) and Assets (POST*ΔASA) showed negative (-) signs. This means that Gross Profits (ΔGMSAL), Cost of sales (ΔCGSA) and Personnel Expenses (ΔASLR), all of which are the fundamental analysis variables representing profitability, became more significant in the stock market after the crisis. Such changes mean that during crisis, companies that continued to focus on gross sales-oriented growth underwent many difficulties, so that investors gave greater weight on profitability and stability when investing in the stock market. Equipment Investment (ΔCAPEXA) and Assets (ΔASA), both of which represent the growth of the scale of the enterprise, were found to have negative (-) effects during the crisis. This agrees with the fact that company restructuring was received as a good signal in the stock market after the crisis.

This research contributes to the existing research works as follows:

First, the utility of the fundamental analysis generally used for evaluating stocks in Korea has been verified on an actual proof basis, and as opposed to existing works, the fundamental analysis variables used by securities analysts in Korea have been additionally utilized for verification. Second, this research has presented the change that took place sometime in 1997 during the Financial Crisis, in which participants in the stock market, when establishing their investment strategy, emphasize more on profitability than on the gross sales or size of enterprises. Third, this study has presented that there are differences before and after the Financial Crisis in the fundamental analysis variables which securities analysts after the crisis consider significant.

Notwithstanding this contribution, there may be limitations in generalizing the results of this research since only the listed manufacturing enterprises were analyzed. The influence of the industry was not removed. In future research, research works on the enterprises that are included not only in the manufacturing industry but also in the service and financial industries are considered meaningful. Additional research works that shall utilize the unique fundamental analysis variables that are used by securities analysts on an industry basis are necessary.

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